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ABSTRACT

This paper reports on research about professional development programs in environmental education for high school teachers in Quebec (Canada). A diagnostic research study was conducted to attempt to answer two questions: (1) what is the current status of environmental education in this sector of formal education?; and (2) how is environmental education conceptualized and practiced by teachers? The investigation reveals that since 1990, environmental education in Quebec high schools has evolved quantitatively as well as qualitatively. However, in spite of optimistic observations, problems appear to hinder environmental education development or compromise its quality. From a critical perspective, the paper highlights difficulties observed in the study, specifically problems of conceptual, axiological, and pedagogical types. Solutions identified or explored by different environmental education agents also are outlined. (EH)

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Theories and Practices of Environmental Education in Québec High Schools: Main Features of a Critical Diagnosis

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ABSTRACT:
As an initial contribution to the design of professional development programs in environmental education (EE) for high school teachers, a diagnostic research has been conducted, with the aim of answering the following questions: What is the current status of EE in this sector of formal education? How is environmental education conceptualized and practiced by teachers? The investigation reveals that since 1990, environmental education in Québec high schools has evolved quantitatively as well as qualitatively. However, in spite of optimistic observations, many problems appear to be hindering EE development or compromising its quality. From a critical perspective, this paper highlights some of the greatest difficulties observed in the study: problems of conceptual, axiological and pedagogical types. Some of the solutions identified or explored by different EE agents are also outlined.

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Lucie Sauvé

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Theories and Practices of Environmental Education in Québec High Schools: Main Features of a Critical Diagnosis

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As an initial contribution to the design of professional development programs in environmental education (EE) for high school[1] teachers, a diagnostic research has been conducted, with the aim of answering the following questions: What is the current status of EE in this sector of formal education? How is environmental education conceptualized and practiced by teachers?

The study includes three aspects: descriptive, interpretive and critical. The descriptive section, based on a survey process aims to identify, quantify and characterize the actors and activities in environmental education in the schools. The interpretive section, based on discourse analysis (Jodelet, 1991; Abric, 1994), attempts to reveal the actors' representations (including cognitive and affective elements) regarding EE and their own practices. The critical section, based on a collaborative reflective process with selected actors (Carr and Kemmis, 1986; Giroux, 1989; Robottom and Hart, 1993; Elliott, 1995), aims to challenge their theories and practices, to identify desired transformations and pathways for change.

A multimethodological approach (Lefrancois, 1995) was adopted: 1) a mail survey to the 411 public and private high schools in Québec; 2) a phone survey (30-minute structured interviews) with 80 teachers and 20 student-life coordinator[2] (from various urban and rural regions) involved in environmental education (these subjects were identified in the previous survey); 3) two in depth semi-structured interviews (two hours each) with ten (10) of these teachers and five (5) of these coordinators, who were invited to become more involved in the critical section of the investigation; 4) in-depth semi-structured interviews (two hours) with twelve (12) environmental education leaders (from GO's and

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NGO's, from the school system); 5) content analysis of six documents (briefs) presented by different organisations at a national forum on education (*Les états généraux de l'éducation au Québec*, 1996).

Comparing the present results to those of a previous similar studies (Robitaille et Sauvé, 1990; Sauvé et Boutard, 1991), the investigation reveals that since 1990, environmental education in Québec high schools has evolved quantitatively as well as qualitatively. More actors inside the schools can be identified, more partners (from the community, the government, non government and socio-economic spheres) are involved. The influence of these external partners and of the support structures and resources they offer appears to be determinant for EE development, particularly the EE program designed by the largest teachers'union in Québec, the Centrale de l'Enseignement du Québec (CEQ) and the creation of an interministerial committee on EE (Ministries of the Environment, of Education, of Natural resources and of Agriculture). But what has also been of primary importance is the personal initiatives of teachers, whose motivation comes mainly from their own environmental sensitivity (for many a part of their family background or their experiences as youths in natural or rural contexts) and their awareness of the urgent need to solve environmental problems (mainly identified as consumption and waste management problems). The school system seems to be responsive (not proactive) to these internal and external influences. At present, nearly 200 (of the 411) high schools have included EE or intend to include EE in their formal education plan. Some school boards are following the movement and are presenting or preparing environmental and/or environmental education policies.

The quality of environmental education theories and practices has also evolved. For example, as we will elaborate on below, more educational agents are expressing a global conception of environment, where biophysical and socio-cultural elements are seen as interconnected. The action component of EE is now spontaneously expressed by a large majority of teachers. Many of them associate EE with a global educational perspective, including socio-developmental issues (at both the community and planetary level). Different ways are being explored to integrate EE into the school context. More than a hundred types of activities have been identified. In some schools, the curriculum has been restructured so as to provide a more in-depth introduction to EE. Community partnerships are being created as well.

However, in spite of these optimistic observations, many problems appear to be hindering EE development or compromising its quality. From a critical perspective, this paper highlights some of the greatest difficulties observed in this study[3]. Some of the solutions identified or explored by different EE agents are also outlined.

1. Problems related to the conception of EE

Defining EE in the context of an interview has proven to be hard work for the interviewees, even for those who are deeply involved in this field. Each one of them

(112) formulated his or her own definition. We do not consider this phenomenon of conceptual appropriation to be a problem: the construction of a personal theory as a basis for (and a result of) action is a necessary process; it should be encouraged and supported (Schon, 1995; Saint-Arnaud 1992; Donay et Charlier, 1993). The problem is the lack of clarity and of internal coherence in the global discourse of many subjects and the confusion between EE and other related educational fields. This last point is discussed below.

Three main conceptions of EE were expressed, particularly in the in-depth interviews (27):

* EE = STS.E education

  For some respondents, EE focuses on the relationship between Man and the biophysical elements (natural and technological) of the living environment. The social dimension is taken into account only in terms of the relationships between sociocultural realities and the biophysical environment. This conception justifies the particular relevance of integrating EE into science teaching, within the overall perspective of science-technology-society (S-T-S) education, where the ethical dimension of scientific activity and of the relationship to the living milieu is taken into account. The environmental dimension of EE is predominant in this conception[4].

* EE = environment relationship education

  Other respondents regard EE as a fundamental aspect of overall human development: it has to do with the relationship between human being and the living milieu, perceived as a set of biophysical elements, natural as well as man-made (technological, historic, architectural, esthetic, related to urban planning, etc.), essentially related to the sociocultural aspects of this environment. The living milieu (local and global) is the medium supporting life, hence its quality must be preserved and its resources conserved. However, it is also a focal point for interaction in the developmental process of individuals and social groups. This conception justifies a transdisciplinary approach. Special attention is paid to the educational dimension of EE.

* EE = global education

  There are still other respondents who view EE as education concerning the global living milieu, encompassing both its sociocultural and its biophysical aspects. According to this view, the environment is everything and we are an integral part of it. Thus, the boundaries of EE are not well defined and it becomes diluted in other educational areas such as education about/for peace, human rights, development, international development, and so forth. For some respondents, the notion of education about/for sustainable

development (which is still poorly defined - Sauvé, 1996) enables them to take into account all of these dimensions related to social development. EE is viewed as global education. In EE, educators pursue the same objectives as those of education in a planetary perspective (*L'éducation dans une perspective planétaire*, in the meaning of the CIDA --Canadian International Development Agency--term) or education in a world perspective (*L'éducation dans une perspective mondiale*, in the meaning of the IDRC--International Development Research Center--term). It also encompasses what is referred to as international education, according to the international school movement. Underlying this vision of EE is a desire for global social change and the integration of contemporary dimensions of education.

Accorging to the first conception of EE (STS.E education), science teaching is the appropriate "niche" for environmental education. The problem here is that the scope of EE is narrowed. Moreover, while many science teachers recognize the relevance of EE in their teaching, most of them feel that there is actually very little time for EE: the programs are overloaded with disciplinary objectives; EE is important but should not take the place of "real science". The strategies used to integrate EE in science teaching are still unknown: most teachers only "speak about the environment" in their classroom when the program objectives suggest it.

According to the third conception (global education), EE includes all types of social and ecological relational activities. As an example, for some respondents, a visit to old people or a project to help new immigrants to integrate into the community are identified as EE activities. Environmental education, as oriented towards conservation and biophysical problem solving, appears limited with regards to the multidimensional character of contemporary issues. There is a need to integrate the different educational dimensions which open the school to current social issues, and which promote the values of respect, responsibility, equity and solidarity. Some think that EE should be redefined in that sense. For others, such an exercise would be an error: they beleive that EE should be identified more precisely (though the idea of standards has not been suggested by any respondent), so as to be adequately situated in the global mosaic of all other specific and complementary educational dimensions.

Between these two opposite conceptions (one restrictive, the other very broad), we find a continuum of different conceptions of EE. While the diversity of existing conceptions allows for exploring the many dimensions and possibilities of EE, it seems to cause problems with regard to concerted action among the actors of EE. Different languages and significations coexist and, regardless to the conception they adopt, the actors express their discomfort with this situation.

It seems that it is not so much the underlying conception of **education** that explains these different perceptions of EE: most of the respondents readily refer to the

development of critical thinking and a sense of responsibility through a process of teaching and learning where the student is called upon to be the architect of the "construction" of knowledge that is relevant, useful with regard to action. It is more through the conception of **environment** that the different interpretations can be explained: some consider the biophysical components of the environment (mainly resources and immediate "landscape"); others define the environment as a global eco-socio-system (to borrow Goffin's expression, 1993); for others, the environment is everything, of which we are an integral part. The notion of **development** also poses a problem. For some, it means the economic development of societies (and the notion of sustainable development takes a more specific meaning here); others refer to social development in general, including economic development; still others consider the development of people and social groups, in an educational perspective. For many, the notion of development (while central in their discourse) appears vague and/or seems to cover successively different meanings. Before defining EE, these three basic concepts need to be clarified by teachers and other educators.

2. Problems related to EE objectives

The objectives expressed by the 100 survey respondents (answers to an open-ended question and information included in their global discourse) have been analyzed in the light of the axiological proposal of UNESCO (1978), which includes five categories of objectives: awareness, knowledge, attitudes and values, skills, and action.

The results show that the objectives of awareness and action are those expressed most often: each of these categories of objectives can be found in more than 50% of the axiological statements; 24% of statements include exclusively this combination of two objectives (as in "Stimulate awareness. Encourage action"). The link betweeen awareness and action is rarely clarified though: awareness for action; awareness for the development of values; awareness by the action (as in "awareness is developed in the action"); awareness of the importance of action, etc.

Action is now expressed as a lietmotif in the discourse of most environmental educators. For the respondents who intervene mainly in the extracurricular context, action is valued as a necessary source of motivation for the students ("Youngsters do not like discussion, they like action."), and actions express values, thus contribuing to value education. The importance of environmental value education is explicitly expressed in 25% of the axiological statements. But reflexion on or in action is not mentioned by any of the respondents.

Few respondents formulate objectives associated with the development of competencies: knowledge is included in 14% of the statements and skills in 14% also (mainly critical thinking and problem solving skills). Between awareness and action, it appears that for most respondents, there is a missing link of know-how.

Moreover, the action statements refer mostly to individual actions: gestures, habits, behaviors, minor initiatives. These actions are mainly associated with consumption and waste management (recycling). Few respondents mentioned collective action. This is probably the reflection of the fact that the traditional classroom teaching context does not easily lend itself to group action projects; EE aims to motivate small gestures outside the classroom or the school. The extracurricular context seems better suited to collective action projects (mainly of the waste management type), but only a minority of students are involved in extracurricular activities and this context is rarely used to promote a genuine learning process. There is very rarely room for critical reflexion in and on action or for the objectivation (or metacognition) of experiential learning that could take place: there seems to be a confused hope that some magical learning will occur. Some respondents fear activism, or types of action projects designed by adults who enlist obedient students. The instrumental dimension of EE is rarely associated with the reflexive one. The objectives of most projects are usually not clearly stated and most of the time, there is no evaluative process.

3. **Problems related to EE pedagogy**

Teachers seem to have difficulty talking about pedagogy. They rarely have the opportunity to participate in pedagogical discussion. Their response to the question "how do you practice environmental education?" is mainly a descriptive discourse: they identify the ongoing activities in a concrete and general approach (as "we do composting and recycling... we have bought recycling boxes for each classroom...."). In general, they recognize the importance of acting on real, concrete problems. But they need help to finally identify and put a name to the pedagogical approaches and strategies they use (such as eco-management projects, interdisciplinary problem-solving process, group discussions, interactive presentations, etc.), thus giving their intervention a perspective of transferability.

For many environmental educators, EE does not seem to have a pedagogical dimension. For the most part, they talk about environment in their classes and/or they organize action projects in extracurricular context (50% of the teachers involved in EE intervene in both contexts). They do not however seem a priori truly concerned about issues related to EE teaching and learning. It takes a lot of time (often four hours of interviews) to penetrate the pedagogical dimension of their work, to help them to clarify and express their personal pedagogical theory and practice.

Discourse analysis also allows us to see if (and how) respondents refer to the EE pedagogical principles proposed by UNESCO (1976), such as cooperative learning and interdisciplinarity. A few outlines are presented below:

* None of the interviewees spontaneously mentioned cooperative learning as a didactic strategy, either in the classroom or in extracurricular action projects. Most of them mention the vital importance of partnership in EE (from inside or outside of the school), but this partnership is mainly for financial or logistical support. There is no mention of the development of a genuine learning community, where people learn from each other, where there is a collective construction of learning. When experiences of community problem-solving are reported, communication between the students and the other actors in the community is unidirectional: people from the community come to the school to talk to the students, and after their study is completed, students convey their findings to the community (in a journal article, for example). A real dialectical and cooperative learning process is very rarely seen.

* Very few respondents talk about multi- or interdisciplinarity. The structural context of the high schools (subject-centered) does not favour disciplinary integration. Many of the respondents though feel uncomfortable with the narrow context of disciplinary teaching; EE is given very little room and is often relegated to extracurricular activities. Most often, this structural context is seen as inevitable and is not critically approached (from a transformative perspective). The subjective perception of the program barriers adds to the prescribed constraints.

Teachers feel overloaded with a hard job. Pedagogical innovation and didactic work is a luxury they generally cannot afford. They are most often working alone: it is difficult to share their EE concerns and to work in teams with colleagues. Their EE projects or activities are rarely discussed and disseminated among their peers.

4. Possibilities

The many difficulties listed above were expressed by teachers or were identified in their discourse. Despite these problems, the overall investigation process revealed that teachers involved in EE are deeply convinced of the need to introduce EE in high school; they remain dynamic and even optimistic. The investigation has revealed a real pool of energy and unleashed a fload of words. In general, the respondents appreciated the interview as an opportune time to reflect on their practice and to share some of it. Finally, while problems were identified, many pathways to solutions were also revealed. The high school milieu presents both problems and solutions.

The main problem appears to be the structure of the curriculum (discipline-centered), accompanied by time and space barriers. Different solutions are currently being designed and validated to introduce EE as a transdisciplinary dimension of education. For example, taking avantage of the new beginning moves towards decentralization of in school administration, four schools (in different regions of Québec) have developed special curricula, rearranging time schedules and modifying the disciplinary programs so as to introduce EE. The idea is to infuse EE in the different courses and most of all, to

dedicate a large part of the time schedule to interdisciplinary EE projects. This context favours not only the integration of disciplinary learnings, but also facilitates the integration of the different dimensions of contemporary education: peace, intercultural, human rights, global, international, media, etc.

In more conservative school contexts, where the instutionalization process of EE is more difficult or less desired, some teachers have developed an expertise in conducting multi-disciplinary or interdisciplinary projects in EE with colleagues. They have learned how to interprete the disciplinary programs in order to find room for "pedagogical freedom". Other teachers have developed EE pedagogical models in the teaching of one or another subject, enriching the disciplinary content or using a thematic approach. Finally, some teachers who intervene both in the school and extracurricular context, are trying to develop links between theese two contexts for a more holistic EE process: the first context permits more structured learning concerning content and cognitive skills; the second gives the opportunity fot action projects, as a laboratory for experimenting and developing these competencies. As some experiences have shown, an "underground" pedagogy may be developed in the extracurricular context, thus stimulating innovation in the academic teaching/learning context.

There is an interesting expertise among high school teachers involved in environmental education. This expertise can be considered as the impetus for EE development. It needs to be revealed and disseminated. Of course, this is not an easy process. Teachers need to be supported as they clarify their own theory and practice so as to construct their model of intervention. Modelization is a crucial step in the dissemination process: it allows teachers to go beyond the anecdotal aspect of specific activities or projects and to facilitate the transfer of expertise to other contexts. Models of intervention, proposing a contextually relevant theoretical framework and a coherent practice, could be a source of inspiration for other teachers. Such a repertoire of EE models could be very useful for profesionnal development programs for teachers in EE, especially if they propose pedagogical strategies adapted to link awareness and action with the development of competencies associated with critical thinking and problem-solving process.

Of course, the modelization exercise is in itself a professional development process for teachers who are involved in it[5]. Three phases have been identified (Sauvé, 1997): clarification, confrontation and change.

- Clarification of one's own initial EE theory and practice (in a dialogic process - through interviews and conversations);
- Confrontation of these initial elements against other theories and practices of EE (in a dialectic process); confontation of one's own theory against one's own practice, to verify pertinency and coherence or to identify gaps or missing links (in a reflexive process);
- Change: consolidation or enrichment or transformation of one's own theory and practice (in a research-action process).

This entire exercise allows for the development of sharper, more complete and contextually relevant EE theories; with formal (définition), axiological (goals and objectives), strategic (procedures) and explicative elements (following Maccia's typology, in Legendre, 1993).

As mentioned by Jickling (1993) and Robottom (1990), EE is a relatively new educational field, still in the process of theoretical construction. Contributions should be welcome, moreover, if they come from a real praxis (reflexion in, on and for action by the main actors). The matter of defining EE is still open to "contestation and consensus", following Robottom's expression (1993). Between the project of EE standardization (Roth, 1991) and the desire to find in environmental education (or in education for sustainable development) the big WHOLE of the global contemporary education, there is room for more and more reflexion.

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1. In the province of Québec (Canada), high school includes grades 8 through 11. Students are between 12 and 17 years old.

2. In Québec high schools, these professionals are called "animateurs de vie étudiante". Many of them play an important role in environmental education.

3. A comprehensive report of the study has been produced (Sauvé et al, 1997). In order to avoid the presentation of more contextual results and to search for possible general interest, this paper presents the main features of the critical part of the study.

3. The environmental dimension of EE focuses more on the environmental issues of EE, wheras the educational perspective focuses more on the educational issues of EE.

5. Our research program includes experimenting with such a process with 12 teachers involved in EE.

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